Occupational Lead Exposure Control

MSC-RD-12389

Revision 3

Effective Date: May 20, 2015

Topic: Safety and Health

Approved for Public Release;
Further Dissemination Unlimited

Occupational Lead Exposure Control

CHANGE SUMMARY

Rev. 3
Description of Change:
Update to proscribed wording for signs on contaminated clothing and equipment (3.3.16) and for the lead work area (3.3.20).

Rev. 2
Description of Change:
Remove references to MSC-PRO-120 which is being replaced with DOE-0352 "Hanford Site Respiratory Protection Program".

1.0 PURPOSE

This Level 2 Requirements Document (RD) conveys the requirements necessary to implement a program for the control of occupational exposure to lead and lead compounds for all Mission Support Alliance (MSA) team employees, MSA pre-selected subcontractor employees, and for MSC Construction subcontractors and their lower tier subcontractors . It is based on requirements of the Occupational Safety and Health Act (OSHA) standards 29 CFR 1910.1025, (*Lead* for general industry operations) and 29 CFR 1926.62 (*Lead* for construction projects) and Department of Energy (DOE) 10 CFR 851 requirements.

2.0 SCOPE

The OSHA lead standards and this program apply to metallic lead, all inorganic lead compounds and lead soaps. Excluded from coverage are all other organic lead compounds. See Appendix A for information regarding typical lead containing materials/compounds, activities which may result in employee exposure to lead and/or lead compounds. This appendix also includes a review of the types of operation covered by the *Lead* construction standard (29 CFR 1926.62) which may include maintenance operations by MSA employees as well as projects by MSC Construction subcontractors and their lower tier subcontractors.

For any given operation or activity, either the OSHA *Lead* general industry standard (29 CFR 1910.1025) or the OSHA *Lead* construction standard (29 CFR 1926.62) applies. Both cannot apply at the same time to the same activity. Full and appropriate implementation of the requirements of this program will require that the applicable OSHA standard be determined for each covered activity prior to commencement of the activity. Line management, supported by the project/facility Safety and Health (S&H) professional, should categorize operations and activities as either construction or general industry during the work planning process.

Permissible Exposure Limit/Action Limit

Both OSHA *Lead* standards impose a Permissible Exposure Limit (PEL) of 50 micrograms per cubic meter of air ($50ug/m^3$) as an 8-hour Time Weighted Average (TWA), and require that the employer ensure that no employees are exposed to lead at concentrations greater than the PEL. Both standards also impose an Action Limit (AL) of 30 micrograms per cubic meter of air ($30ug/m^3$), as an 8-hour TWA and require that a number of employer actions (e.g. medical surveillance, training) be implemented when employee exposures occur at or above the AL.

De minimus condition for lead in construction activities

The OSHA standards do not establish a de minimus level of lead in materials below which no action would be required under the standard. For dust generating operations, this Occupational Lead exposure Control Program suggests a de minimus condition that is safe from occupational exposures above the AL when (a) the total lead content of materials is less than 1,000 ug/g (ppm) (0.1%) and (b) total particulates in the breathing zone of workers are maintained below the Particulates Not Otherwise Classified (PNOC) Threshold Limit Value (TLV) of 10 mg/m^3 as an

8-hour TWA. Both of these criteria must be met. This de minimus condition does not apply to lead fume-generating activities (i.e., heat producing activities greater than 700 F such as welding and burning). Additional de minimus lead level rationale is located in Appendix B. Qualitative and quantitative exposure assessment and other accepted industrial hygiene analysis methods and rationale might also be used to determine/evaluate de minimus levels of lead.

3.0 REQUIREMENTS

NOTE: *For the tables in this section under the requirement "type" column, "V" means verbatim and "I" means interpreted.*

3.1 Hazard Identification and Documentation

#	REQUIREMENT	TYPE V or I	SOURCE
1.	Line management shall ensure the identification of all work activities which may result in employee exposures to lead and ensure that the project/facility S&H professional participates in or conducts the hazard identification.	I	10 CFR 851.21(a); 10 CFR 851.23, (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
	NOTE 1: *See Appendix A for information regarding typical lead containing materials/compounds and activities that may result in employee exposure to lead and/or lead compounds.*		
	NOTE 2*: The following activities may be used as means to identify and evaluate the potential lead hazards for a task, operation, or facility:* • *Review material data safety sheets, especially for any paint products,* • *Review any material or product specifications to determine if lead is present,* • *Evaluate past use of products that may have contained lead such as paint, mortar, shielding, and solders,* *Review environmental survey and characterization data for lead content of building substrates or environmental media.*		
2.	As necessary to identify and evaluate the potential for lead hazards, line management shall arrange for the project/facility S&H professional to quantitatively determine, through sampling or field tests, the presence of lead in substrates or materials involved in the work.	I	10 CFR 851, Appendix A, item 1 & 6

3.	When work activities which may expose employees to lead are identified, line management shall ensure that a determination is made as to whether the activity is governed by the OSHA *Lead* general industry standard (29 CFR 1910.1025) or the OSHA *Lead* construction standard (29 CFR 1926.62).	I	10 CFR 851.21(a); 10 CFR 851.23, (3) (7) & (9)
	NOTE: *See Appendix A for the types of operation covered by the lead Construction standard (29 CFR 1926.62).*		
4.	When work activities are governed by the OSHA *Lead* construction standard (29 CFR 1926.62), line management shall ensure the designation of a "competent person", who will be involved with hazard identification and control, on a day-to-day basis, from planning through completion of the work activity. A competent person shall be one who is trained (completion of course #s 020150 (*Lead (Pb) Worker Training*) and 110069, (*Training Completion Record - MSA Competent Person for Lead* (form A-6005-672)), or equivalent), capable of identifying existing and predictable lead hazards and who has the authorization to take prompt corrective measures to control the hazard.	I	10 CFR 851, Appendix A, item 1 (b) & item 6
	NOTE: *The "competent person" may be the project/facility S&H professional, although other individuals capable of identifying and controlling lead hazards may be more appropriate.*		
5.	The project/facility S&H professional shall support the "competent person" to ensure lead hazard identification, evaluation, and control and shall coordinate his/her activities to provide support.	I	10 CFR 851, Appendix A, item 1& 6
6.	Prior to commencement of any work activity which will or is likely to result in employee exposures at or above the PEL, line management shall ensure the development of a *Lead Compliance Plan* (Site Forms A-6001-891 or A-6004-296) and ensure the participation of the designated "competent person" and the project/facility S&H professional in the development of the *Lead Compliance Plan.*	I	10 CFR 851.21(a); 10 CFR 851.23, (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
7.	If Site Form A-6001-891 or A-6004-296 is not used, an acceptable *Lead Compliance Plan* shall contain all of the following elements : a. Description of activities emitting lead; b. Specific means to achieve compliance with the PEL and the OSHA standard's requirements, including	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6

	engineering controls and justification(s) for selection of engineering controls; c. Technology to meet the PEL; d. Air monitoring data to document lead emission sources; e. Detailed schedule for implementation; f. Work practices, personal protective equipment, housekeeping, hygiene facilities, and others; g. Administrative control schedule; h. Arrangements between multiple contractors and subcontractors regarding compliance and hazard information (required for construction activities only); and i. Other pertinent information, as necessary. **NOTE:** *Construction subcontractors use form A-6004-296 and the attached Pre-Job Safety Planning Signoff to document employee review of the Lead Compliance Plan. As part of a planned work package, MSA employees use the Pre-Job Briefing Checklist, Site Form BD-6000-696, to document review of the Lead Compliance Plan and the prejob attendees.*		
8.	For construction activities governed under 29 CFR 1926.62, line management shall ensure that, during and prior to the completion of the initial exposure assessment, the interim employee protective measures specified in Item 3.3.3 are fully implemented.	I	10 CFR 851.23 (a) item (7); 10 CFR 851, Appendix A, item 1& 6

3.2 Employee Exposure Monitoring and Notification

1. Initial Determination

a.	Line management shall ensure that initial determination of employee exposures are based upon exposure monitoring results and any of the following: 1. Information, observations, or calculations which would indicate employee exposures to lead; 2. Any previous measurements of airborne lead; and 3. Employee complaints of symptoms that may be attributable to exposure to lead.	I	10 CFR 851.21(a) 10 CFR 851.23 (a) item (3) (7) & (9); 10 CFR 851, Appendix A, item 6 (a)
	NOTE: *"Historical" data obtained within the 12 preceding calendar months for the same or similar jobs (those jobs during which work operations conducted under workplace conditions closely resembling the processes, types of materials, control methods, work practices and environmental conditions prevailing in the*		

	current operations) may be used to satisfy the initial monitoring requirements when the sampling and analytical methods used to obtain and analyze the "historical" samples are the same as specified in 29 CFR 1910.1025(d)(9) and 29 CFR 1926.62 (d)(9).		
b.	When employee exposure monitoring for the initial determination is conducted, sampling shall be conducted, as a minimum, on a representative sample of the employees who the employer reasonably believes are exposed to the greatest airborne concentrations of lead.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 6
	NOTE: *Instead of initial monitoring, objective data demonstrating that a particular product or material containing lead or a specific process, operation or activity involving lead cannot result in employee exposure to lead at or above the action level during processing, use or handling may be used. If used, such data must be documented.*		
c.	If the objective data referred to in the note above is used, all such data shall be documented in writing, and the project/facility S&H professional shall ensure that a copy of the documentation is forwarded to MSA RD point of contact (or SME) for retention in IDMS MSA PHMC IH topical records area, or equivalent industrial hygiene (IH) records per MSC-PRO-409, as per the requirements of 29 CFR 1926.62 (n)(4)(ii).	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
d.	Line management shall ensure that exposure monitoring or other data from the initial determination is used as input for the *Lead Compliance Plan.*	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1& 6

2. Periodic Exposure Monitoring Following Initial Determination

a.	When an initial determination done pursuant to Section 3.2.1 shows the possibility of employee exposure at or above the AL, line management shall ensure that exposure monitoring is conducted which is representative of the exposure for each employee in the workplace who is exposed to lead.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 6 (a)
	NOTE: *As is the case for the initial determination, "historical" data obtained within the 12 preceding calendar months for the same or similar jobs (those jobs during which work operations conducted under workplace*		

	conditions closely resembling the processes, types of materials, control methods, work practices and environmental conditions prevailing in the current operations) may be used to satisfy the periodic exposure monitoring requirements when the sampling and analytical methods used to obtain and analyze the "historical" samples are the same as specified in 29 CFR 1926.62 (d)(9) and 29 CFR 1910.1025(d)(9).		
b.	When employee exposure monitoring is done to comply with the requirements in this section, the exposure monitoring samples shall be full-shift personal samples including at least one sample for each job classification in each work area either for each shift or for the shift with the highest exposure level. Full shift personal samples shall be representative of the monitored employees' regular daily exposure to lead.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 6 (a)
c.	When the initial determination (or any subsequent determinations) reveals employee exposures to be at or above the AL, but at or below the PEL, line management shall ensure that employee exposure monitoring is performed at least every 6 months until at least 2 consecutive measurements, taken at least 7 days apart, are below the AL. At such a time, monitoring for that employee can be discontinued unless additional monitoring is indicated as a result of additional exposure assessments done pursuant to Section 3.2.3.	I	10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, 6(a)
d.	When the initial determination (or any subsequent determinations) reveals employee exposures to be above the PEL, line management shall ensure that employee exposure monitoring is performed at least every 3 months until at least 2 consecutive measurements, taken at least 7 days apart, are at or below the PEL, but at or above the AL. At such a time, monitoring for that employee shall be conducted pursuant to the requirement specified in Item 3.2.2.c.	I	10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 6 (a)
e.	When an initial determination done pursuant to Section 3.2.1 is made that no employee is exposed to airborne concentrations of lead at or above the AL, line management shall ensure that a written record is made of that determination which includes all pertinent data from the initial determination and the names and unique employee identification numbers of each employee monitored during the initial determination.	I	10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 6 (a)

3. Additional Exposure Assessments

a.	Initial determinations meeting all requirements of Section 3.2.1 shall be repeated whenever there is a change of equipment, process, controls, personnel or a new task has been initiated that may result in additional employees being exposed to lead at or above the AL or may result in employees already being exposed at or above the AL to be exposed above the PEL.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 6 (a)

4. Employee Notification/Observation of Monitoring

a.	Line management shall ensure that affected employees (or their designated representatives) are provided with the opportunity to observe any employee lead exposure monitoring and shall ensure practice of the observation procedures specified in 29 CFR 1926.62(o)(2) and 29 CFR 1910.1025(o)(2).	I	10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 6 (a)
b.	Within 5 days (15 days for 1910.1025 (d)(8)(i)) after completion of exposure assessments completed pursuant to the requirements of this RD, line management shall ensure that each employee is notified in writing of assessment results that represent that employee's exposure.	I	10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 6 (a)
c.	Line management shall ensure that, whenever exposure assessment results indicate that representative employee exposures, without regard to respirators, is at or above the PEL, the written notice required in Item 3.2.4.b shall include a statement that the employee was at or above the PEL and a description of the corrective actions taken or to be taken to reduce exposures to below that level.	I	10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 6 (a)
	NOTE: *Actions described in the Lead Compliance Plan may be used to fulfill that part of the requirement above relating to "...corrective actions taken or to be taken to reduce exposures to below that level."*		

5. Exposure Monitoring Data Management

a.	Document all employee exposure data, as per and according to the requirements in MSC-PRO-409, *Industrial Hygiene Monitoring, Reporting and Records Management*. If not required per requirements in MSC-PRO-409, all lead exposure monitoring records shall also include the following: 1. Date, number, location, duration and results of each exposure monitoring sample;	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 6 (a)

	2. A description of the sampling and analytical methods used; 3. The types of respiratory protection devices used; 4. Name, unique employee identification number and job classification of the employee monitored and of all the other employees whose exposure the monitoring results is intended to represent; 5. The environmental variables that could affect the measurement of employee exposure		

3.3 Hazard Control

1.	Line management shall ensure that lead hazard identification is included during work/job design and planning, and shall ensure that the project/facility S&H professional conducts or participates in the hazard identification process.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) (7) & (9); 10 CFR 851, Appendix A, item 1 & 6
2.	Line management shall implement engineering and work practice controls, including administrative controls, to reduce and maintain employee exposure to lead to a level at or below the PEL to the extent that such controls are feasible. Wherever all feasible engineering and work practice controls that can be instituted are not sufficient to reduce employee exposure to or below the PEL, line management shall use them to reduce employee exposures to the lowest feasible level and shall supplement them by use of respiratory protective equipment as required elsewhere in this RD.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
3.	For work activities covered under 29 CFR 1926.62, implement the following interim protective measures until the initial exposure assessment is completed and documented to show that employees performing the tasks listed in Table 1 are not being exposed to lead in excess of the PEL: a. Respiratory protective equipment per Table 1; b. Personal protective clothing specified in Item 3.3.14; c. Change areas, as specified in Item 3.3.19; d. Hand washing facilities, as specified in Item 3.3.19; e. Enrollment, into the lead medical surveillance program; f. Training • *Lead Hazard Communication* training as specified in Item 3.5.1,	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (7); 10 CFR 851, Appendix A, item 1 & 6

	• Respiratory protective equipment training as required by 29 CFR 1910.134, *Respiratory Protection*, and • Training to 29 CFR 1926.21, *Safety Training and Education*.		
4.	Prior to commencement of any work activity which will or is likely to result in employee exposures at or above the PEL, line management shall ensure that the *Lead Compliance Plan* specified in and meeting the requirements of Items 3.1.6 and 3.1.7 is completed by management/supervision, reviewed by the "competent person" and the project/facility S&H professionals and its contents communicated to all affected employees.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
5.	Line management shall ensure that the designated "competent person", assisted by the project/facility S&H professional when appropriate, performs frequent and regular inspections of job site(s), materials and equipment.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
6.	The designated "competent person", assisted by the project/facility S&H professional as appropriate, shall regularly verify and document determinations that work practices and hazard control measures are performing as designed and as required to control employee exposures to lead.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
7.	Line management shall ensure that *Lead Compliance Plans* are reviewed every 6 months and are revised/ updated, as necessary.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
8.	When administrative controls are used as a means of reducing employee TWA exposures to lead, the job rotation schedule shall include the following: a. Name or identification number of each affected employee; b. Duration and exposure levels at each work station where each affected employee is located; and c. Any other information that may be useful in assessing the reliability of administrative controls to reduce exposures to lead.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6

9.	For lead activities/operations covered under 29 CFR 1910.1025 and where ventilation is used to control employee exposures, measurements which demonstrate the effectiveness of the system in controlling exposures (such as capture velocity, duct velocity or static pressure) shall be made every 3 months and measurements of the system's effectiveness in controlling exposure shall be made within 5 days of any changes to production, process or control which might result in a change in employee exposure to lead. All ventilation measurement results shall be documented in the applicable *Lead Compliance Plan(s)*.	I	29 CFR 1910.1025; 29 CFR 1926.62
10.	When respirators are used for protection against lead exposure, line management shall ensure that respirator use is according to DOE-0352, *Hanford Site Respiratory Protection Program*	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) (7) & (10); 10 CFR 851, Appendix A, item 1 & 6
11.	Line management shall ensure that respirators are used: • For lead activities/operations covered under 29 CFR 1926.62 – periods when respirators are required to provide interim protection of employees, according to Item 3.3.3; and • For lead activities/operations covered under 29 CFR 1910.1025 – during periods necessary to install or implement engineering or work-practice controls; and • During work operations for which engineering and work-practice controls are not sufficient to reduce employee exposure to or below the PEL; and • During periods when an employee requests a respirator.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) (7) & (10); 10 CFR 851, Appendix A, item 1 & 6
12.	When respirators are used, line management shall ensure that the appropriate respirator (or combination of respirators) is used, according to the requirements in Table 2.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) (7) & (10); 10 CFR 851, Appendix A, item 1 & 6
13.	Line management shall ensure that, when employees request it, a powered-air purifying respirator (PAPR) is provided instead of the respirator specified, as long as the PAPR provides the same or greater protection.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) (7) & (10); 10 CFR 851, Appendix A, item 1 & 6

14.	When employees are exposed to lead at or above the PEL, when the possibility of skin or eye irritation exists and/or as an interim protective measure for 29 CFR 1926.62-covered work (see Item 3.3.3) line management shall provide, ensure use of, keep laundered and maintain the effectiveness of protective work clothing according to the requirements of 29 CFR 1910.1025(g) or 29 CFR 1926.62(g)	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
15.	Line management shall ensure that lead-contaminated protective clothing is removed at the completion of a work shift only in change areas provided for that purpose.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
16.	Line management shall ensure that contaminated protective clothing and equipment that is to be cleaned, laundered or disposed of is placed in a closed, labeled container in a manner that prevents contamination of any areas outside the container. The container shall be labeled as follows: DANGER: *Clothing and equipment contaminated with lead. May damage fertility or the unborn child. Causes damage to the central nervous system. Do not eat, drink or smoke when handling. Do not remove dust by blowing or shaking. Dispose of lead contaminated wash water in accordance with Applicable local, state, or federal regulations.* Prior to June 1, 2015, the containers may be labeled with the following wording. **CAUTION** *Clothing contaminated with lead. Do not remove dust by blowing or shaking. Dispose of lead contaminated wash water in accordance with applicable local, state or federal regulations.*	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
17.	Line management shall ensure that all surfaces are as free as practicable of accumulations of lead and shall use cleaning methods that minimize the likelihood of lead dust becoming airborne.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6

18.	Line management shall ensure that the following cleaning practices/prohibitions are observed: • Floors and other surfaces where lead accumulates may not be cleaned by the use of compressed air; • Shoveling, dry or wet sweeping may only be used where vacuuming or other equally effective methods have been tried and found not to be effective; and • When vacuuming methods are selected, the vacuums shall be equipped with a HEPA filter and used and emptied in a manner that minimizes the re-entry of lead into the workplace.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
	NOTE: *For lead activities/operations covered under 29 CFR 1926.62, compressed air may be used to clean surfaces, but only if it is used in conjunction with a ventilation system designed to capture the airborne lead dust created by the compressed air.*		
19.	When employees are exposed to lead at or above the PEL and/or as an interim protective measure for 29 CFR 1926.62-covered work (see Item 3.3.3) line management shall provide and ensure use of the hygiene facilities and practices specified in 29 CFR 1910.1025(i) or 29 CFR 1926.62(i).	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
20.	Line management shall ensure that the following warning sign is posted in each work area where the PEL is exceeded: DANGER *Lead work area May damage fertility or the unborn child. Causes damage to the central nervous system Do not eat, drink or smoke in this area* Prior to June 1, 2016, the work area may be posted with the following wording. **WARNING** LEAD WORK AREA POISON NO SMOKING OR EATING	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6

Table 1
Construction Activities That Require Respiratory Protection as an Interim Protective Measure[1]

Activity[1]	Minimum Respiratory Protection Required[2]
• Lead-containing coatings or paints - manual demolition (e.g., dry walls), manual scraping, manual sanding, heat gun applications, power tool cleaning with dust collection system. • Spray painting with lead paint. • Others with possibility of exposures at or above PEL.	Respirator with Protection Factor (PF) of at least 10, such as half facepiece Air Purifying Respirator (APR).
• Using lead-containing mortar or lead burning. • Lead-containing coatings or paints - rivet busting, power tool cleaning without dust collection system, cleanup activities where dry expendable abrasives were used, movement/removal of enclosures used for abrasive blasting.	Respirator with PF of at least 25 such as hooded/helmeted powered air-purifying respirator (PAPR); or with PF of 50 such as full-facepiece APR or tight fitting full-facepiece PAPR.
Abrasive blasting, welding, cutting, torch burning on surfaces with lead containing coatings, or paints.	Respirator with PF of at least 1,000 or appropriate supplied-air respirator with tight fitting facepiece operated in pressure-demand mode or other positive-pressure mode.

[1] Other interim protective measures are also required for these activities including personal protection equipment (PPE), change areas, hand washing facilities, biological monitoring, and certain training -- see Item 3 3.3. Such measures must remain in place until exposure assessment demonstrates that they may be eliminated or relaxed.

[2] All APRs and PAPRs must be fitted with HEPA filters. Note that Protection Factors assigned to respirators for lead exposure may be different than those assigned for radiological hazards.

Table 2
Respiratory Protection for Lead Aerosols

Airborne concentration of lead or condition of use	Required Respirator for lead activities/operations covered under 29 CFR 1910.1025[1]	Required Respirator for lead activities/operations covered under 29 CFR 1926.62[1]
Not in excess of 0.5 mg/m^3 (500 µg/m^3)	Half-mask APR equipped with high efficiency (HEPA) filters [2,3]	• Half-mask APR equipped with high efficiency (HEPA) filters[2,3] or • Half-mask supplied-air respirator operated in demand (negative pressure) mode
Not in excess of 1.25 mg/m^3 (1250 µg/m^3)	N/A	• Loose fitting hood or helmet powered APR equipped with HEPA filters • hood or helmet supplied-air respirator operated in continuous-flow mode equipped with HEPA filters
Not in excess of 2.5 mg/m^3 (2500 µg/m^3)	Full-face APR equipped with HEPA filters[3]	• Full-face APR equipped with HEPA filters[3] or, • Tight-fitting PAPR equipped with HEPA filters[3] or, • Full-facepiece supplied-air respirator operated in demand mode or, • 1/2 mask or full-facepiece supplied-air respirator operated in continuous- flow mode or, • Full-facepiece, self-contained breathing apparatus (SCBA) operated in demand mode.
Not in excess of 50 mg/m^3 (50,000 µg/m^3)	1. Any PAPR with HEPA filters[3] or, 2. Half-mask supplied air respirator operated in positive pressure mode.[2]	Half-mask supplied air respirator operated in pressure-demand or other positive-pressure mode.[2]
Not in excess of 100 mg/m^3 (100,000 µg/m^3)	Supplied-air respirator with full facepiece, hood, helmet, or suit, operated in positive-pressure mode	Supplied-air respirator with full-facepiece operated in pressure-demand or other positive-pressure mode.
Greater than 100 mg/m^3 (100,000 µg/m^3) or unknown concentration	Full facepiece, self-contained breathing apparatus (SCBA) operated in positive-pressure mode.	Full-facepiece SCBA, operated in pressure-demand or other positive-pressure mode.

Airborne concentration of lead or condition of use	Required Respirator for lead activities/operations covered under 29 CFR 1910.1025[1]	Required Respirator for lead activities/operations covered under 29 CFR 1926.62[1]

[1] Respirators specified for higher concentrations can be used at lower concentrations of lead.

[2] Full-facepiece is required if the lead aerosols can cause eye or skin irritation at the use concentration.

[3] HEPA means 99.97 percent efficient against 0.3 micron (µm)-sized particles.

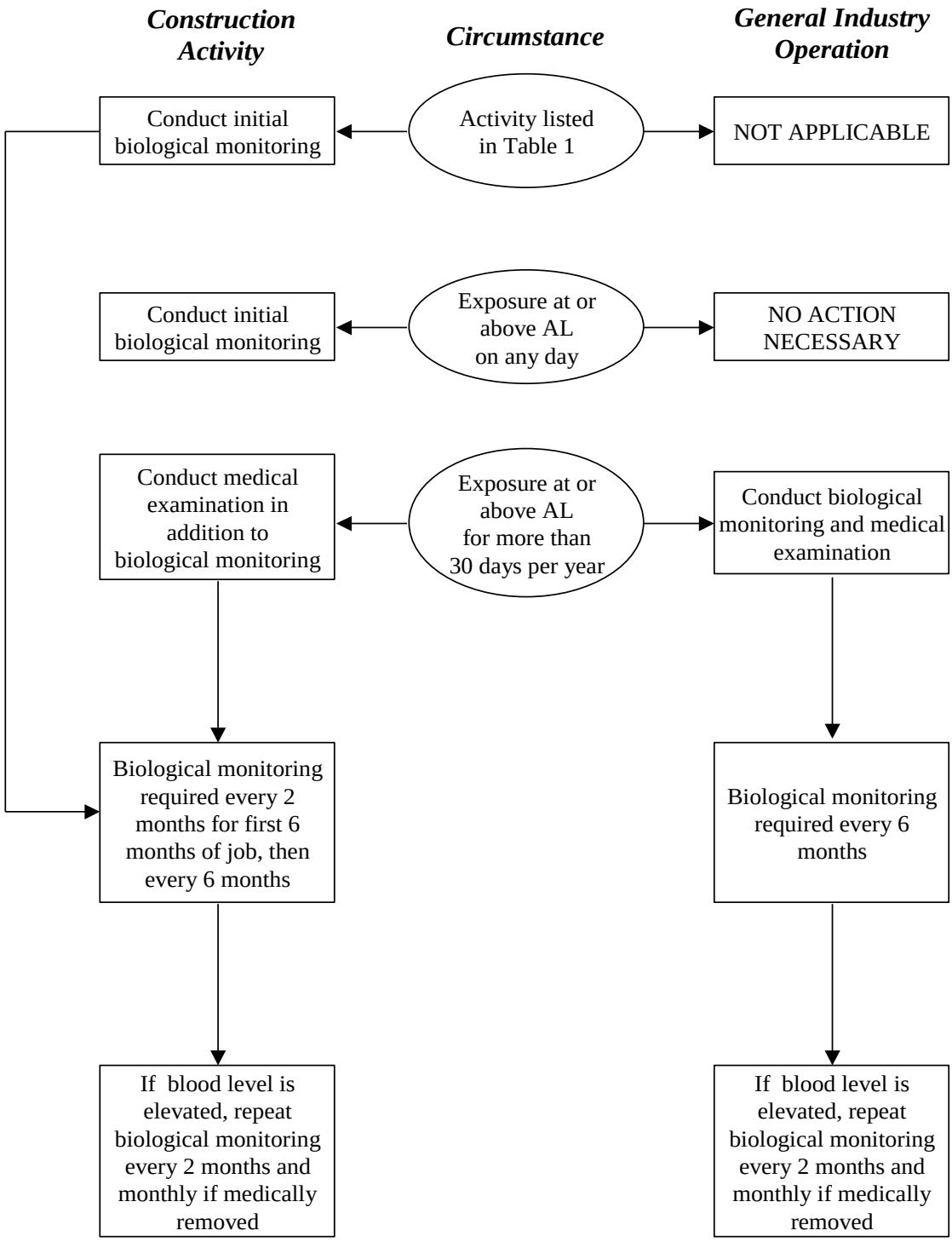
3.4 Medical Surveillance

1.	Line management shall ensure that employees who are or may have occupational exposure to lead at or above the AL are scheduled for medical surveillance.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
	NOTE: *The flow diagram in Figure 1 summarizes the circumstances triggering medical surveillance and the frequency of medical monitoring exams and biological monitoring as required by both 29 CFR 1910.1025 and 29 CFR 1926.62.*		
2.	Prior to an employee beginning a work activity which will or is reasonably expected to expose them to lead at or above the AL on any day, line management shall enroll in or revise the employee medical surveillance program for each affected employee.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
	NOTE 1: *Revising and/or submitting an employee's EJTA triggers the scheduling of an initial lead monitoring medical exam for the employee. The frequency of t exams depends on whether or not the frequency of the individual employee's exposure to lead at or above the AL is noted on the EJTA as less than 30 days per year or as 30 days or more per year. If the exposure is less than 30 days per year, annual exams are scheduled. For employees exposed for 30 or more days per year, bi-annual exams are scheduled.*		

3.	Line management shall revise an employee's EJTA, document the reason for the revision and re-submit the EJTA whenever: • The number of days on which the employee is occupationally exposed to lead at or above the AL changes from less than 30 days per year to equal to or more than 30/days per year; or • The number of days on which the employee is occupationally exposed to lead at or above the AL changes from equal to or more than 30 days per year to less than 30days per year; or • An employee in the lead medical surveillance program will no longer be exposed to lead at or above the AL, or • An employee in the lead medical surveillance program leaves MSA or MSA subcontractor employment.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
4.	Prior to or upon completion of an employee EJTA revision indicating lead exposure at or above the AL, line management shall ensure that the employee is enrolled in the appropriate type of lead training, as detailed in Section 3.5.	I	10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 6
5.	Project/facility S&H professionals shall notify line management of employees who need to be enrolled in the Lead medical surveillance program(s) as well as those who no longer meet the exposure criteria for continued enrollment. Such notifications shall be based on exposure monitoring data, hazard assessment results or other definitive means.	I	10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 6 (a) & (c)
6.	Line management shall ensure that any provisions of the OMSP's (or other employee-designated physician) medical opinion are strictly adhered to (subject to applicable terms of an in-effect collective bargaining agreement), including but not limited to the following: • Protective measures; • Work limitations; • Respirator use restrictions; • Temporary medical removal; • Return to work determinations.	I	10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 6
	NOTE: *10 CFR 851, Appendix A, item 8 indicates that the site OMSP has the responsibility to conduct a medical surveillance program for employees occupationally exposed to lead, according to the requirements in 29 CFR 1910.1025 and 29 CFR 1926.62. That medical surveillance program is assumed to include the following activities:*		

	• *Through the medical scheduling system, assisting line management in scheduling employees for baseline, periodic, and closeout lead medical surveillance exams and biological monitoring, as per the contents of submitted employee EJTAs;* • *Medical surveillance and monitoring per the provisions of 29 CFR 1910.1025/29 CFR 1926.62 (j)(2), (j)(3), (j)(4), and (k);* • *Informing line management, of contents of the written medical opinion necessary to initiate compliance with protective measures, work limitations and/or respirator use restrictions.*		
7.	Project/facility S&H professionals shall assist line management in interpreting the Industrial Hygiene aspects of medical opinions and recommendations, and interface with the OMSP.	I	10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 6(b) & (c)

Figure 1
Lead Medical Surveillance Process Flow Diagram



3.5 Employee Training

1.	In accordance with the criteria in Table 3, line management shall ensure that all employees with occupational exposure to lead are provided with the appropriate type of training, including lead hazard communication, hazard communication, lead worker, respiratory protection, and construction safety. The extent and types of training required are listed in Table 3.	I	10 CFR 851.23 (a) item (3) & (7); 10 CFR 851.25
2.	Line management shall ensure that the training is completed prior to commencement of the work activity that could or does result in occupational exposure to lead.	I	10 CFR 851.23 (a) item (3) & (7) 10 CFR 851.25
	NOTE: *Lead (Pb) Worker Training (MSA course # 020150) and Lead (Pb) Worker Refresher (MSA course # 020152) have been specifically designed to meet the OSHA training requirements.*		
3.	When *Lead (Pb) Worker Training* (MSA course # 020150) and *Lead (Pb) Worker Refresher* (MSA course # 020152) are not attended by the lead workers performing work activities which require training specified in Table 3, line management shall ensure that previous or other training meets the requirements of 29 CFR 1910.1025 (l)(1)(v) or 29 CFR 1926.62(l)(2), whichever is appropriate.	I	10 CFR 851.23 (a) item (3) & (7) 10 CFR 851.25
4.	Line management shall ensure that lead training requirements are included in task-specific work procedures, packages or other work control or job-specific safety and health documents, such as Job Hazard Analysis (JHAs).	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
5.	Line management shall ensure that all affected workers are made aware of the contents of the task-specific *Lead Compliance Plan*, including all work practices, hazard controls and other applicable information, including whenever any changes are made to controls or to the *Lead Compliance Plan*.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
	NOTE 1: *"Lead worker" training and "Lead Hazard Communication" training courses do **not** generally cover the contents of job- or facility-specific "Lead Compliance Plans." This mandatory training element must generally be given at the facility- or job-specific level. Many MSA facilities successfully use such training venues as pre-job safety meetings, or weekly/monthly safety meetings to meet this training requirement.*		

	NOTE 2: *"Lead Hazard Communication" training is not offered as an MSA-wide course, so must generally be delivered at the facility- or job-specific level. Many MSA facilities successfully use such training venues as pre-job safety meetings, weekly or monthly safety meetings to meet this training requirement. It is strongly recommended that the facility S&H professional deliver or be involved in this training when it is required.*		

Table 3
Lead Training Requirements

Part 1 **For operations covered by the OSHA General Industry Lead Standard** **(29 CFR 1910.1025)**	
Circumstance	**Action**
1. Potential exposure to lead at any level.	*Lead Hazard Communication Training* comprised of information found in Appendices A and B of 29 CFR 1910.1025.
2. Exposure at or above action level, or potential for skin/eye irritation*.	*Lead Worker Training* specified by 29 CFR 1910.1025 (1)(l)(v), prior to job assignment and annually.
3. If respirators are used.	*Respiratory Protection Training* (can be included in lead worker training).
*Have facility S&H professional make this determination. Some lead compounds are irritants.	

Part 2 **For operations covered by the OSHA Construction Lead Standard** **(29 CFR 1926.62)**	
Circumstance	**Action**
1. As an interim protective measure for activities in Table 1.	*Hazard Communication Training* (29 CFR 1926.59), *Respiratory Protection Training*, *General Construction Safety Training* (29 CFR 1926.21).
2. Exposure at or above action level on any day, or potential for skin/eye irritation.*	*Lead Worker Training* specified by 29 CFR 1926.62 (l) (2), prior to job assignment and annually.
3. If respirators are used.	*Respiratory Protection Training* (can be included in lead worker training).
* Have facility S&H professional make this determination. Some lead compounds are irritants.	

3.6 Records Management

1.	Line management shall ensure that project/facility S&H professionals enter all lead exposure monitoring data required by Section 3.2 of this RD into the MSA Industrial Hygiene Database (IHD) or equivalent using the work processes described in MSC-PRO-409, *Industrial Hygiene Monitoring, Reporting, and Records Management*."	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
2.	Line Management shall consider retaining other records, such as copies of employee notifications, which indicate actions taken on behalf of the company.	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
3.	Line management shall ensure that affected employees or their representatives have access to all records required by this RD per the requirements in 29 CFR 1910.1025 (n) (4) or 29 CFR 1926.62(n)(5).	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6
	NOTE: *10 CFR 851, Appendix A, item 8 specifies that the site OMSP has the responsibility to conduct a medical surveillance program. Medical records specified in 29 CFR 1910.1025 (n)(2) and (n)(3) and 29 CFR 1926.62(n)(2) and (n)(3) are maintained by the Hanford site OMSP or other employee-designated physician .*		
4.	Line management shall ensure that, if MSA ceases to do business, all records required by this RD to be maintained by MSA are transferred to the successor employer, as per the requirements on 29 CFR 1910.95(m)(5).	I	10 CFR 851.21(a); 10 CFR 851.23 (a) item (3) & (7); 10 CFR 851, Appendix A, item 1 & 6

4.0 FORMS

Pre Job Briefing Checklist, A-6000-696
Lead Compliance Plan Template, A-6001-891
Lead Compliance Plan, A-60004-296
Training Completion Record – MSA Competent Person for Lead, A-6005-672

5.0 RECORDS IDENTIFICATION

All records are generated, received, processed, and maintained by MSC in accordance with MSC-PRO-10588, *Records Management Processes*.

Records Capture Table

Name of Document	Submittal Responsibility	Retention Responsibility
Objective data demonstrating that a particular product or material containing lead or a specific process, operation or activity involving lead cannot result in employee exposure to lead at or above the action level during processing	In accordance with MSC-PRO-409	In accordance with MSC-PRO-409
All lead exposure monitoring data required by this RD	In accordance with MSC-PRO-409	MSA Industrial Hygiene Program Records Coordinator (IHPRC) in accordance with MSC-PRO-409
For MSA team employees, and pre-selected subcontractors: *Lead Compliance Plan Template, Inorganic Lead Control Program,* A-6001-891 or *Lead Compliance Plan,* A-6004-296	In accordance with MSC-PRO-079	Record copy retained in with the document that originated the work. If associated with a work package, retained in the work package.
For MSC Construction subcontractors : *Lead Compliance Plan,* A-6004-296	Buyers Technical Representative	Project Document Control

6.0 REFERENCES

6.1 Source References

T10 CFR 851, *Worker Safety and Health Program*
Occupational Safety and Health Administration (OSHA)
29 CFR 1910.1025, Lead
29 CFR 1926.62, Lead
29 CFR 1910.1020, *Access to Employee Exposure and Medical Records*

6.2 Working References

Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices, American Conference of Governmental Industrial Hygienists, most current edition.

DOE-0352, *Hanford Site Respiratory Protection Program*
MSC-PRO-079, *Job Hazard Analysis*
MSC-PRO-409, *Industrial Hygiene Monitoring, Reporting and Records Management*
MSC-PRO-10588, *Records Management Processes*
29 CFR 1910.134, *Respiratory protection*
29 CFR 1926.21, *Safety Training and Education*
58 FR 26590, *Interim Final Standard, Lead in Construction*

APPENDIX A
Typical lead containing materials and activities

Lead may be found in paints, shielding materials, bulk metals, solders, alloys, nails for metal roofs, mortars, glass, piping systems, ammunition, metal seams and joints, laboratory and process chemicals, various equipment and building components, waste materials, and contaminated environmental media, as well as in other materials.

Lead exposure may result from a variety of operations/activities, including but not limited to the following:

- Lead-brick shielding/handling,
- Weapons firing (patrol),
- Pouring molten lead,
- Soldering,
- Welding/cutting/grinding,
- Sandblasting, abrasive blasting,
- Painting and paint removal,
- Loading lead ballast/shot,
- Use of powder actuated tools,
- Lead cable pulling, and
- Maintenance activities involving lead and/or lead containing materials.

Operations covered under OSHA's *Lead* construction standard (29 CFR 1926.62)

The OSHA *Lead* construction standard defines covered construction work as construction, alteration and repair, including painting and decorating. It includes, but is not limited to the following:

- Demolition or salvage of structures where lead or materials containing lead are present;
- Removal or encapsulation of materials containing lead (e.g. lead paint abatement);
- New construction, alteration, repair, or renovation of structures, substrates or portions thereof, that contain lead or lead-containing materials;
- Installation of products containing lead;
- Lead contamination/emergency cleanup;
- Transportation, disposal, storage, or containment of lead or lead-containing materials on the site or location at which construction activities are performed; and
- Maintenance operations associated with the construction activities described in this paragraph.

Work covered by the construction standard may include work activities that require interim controls and protective equipment, including respiratory protection, until an exposure assessment is completed. These requirements are discussed in Item 3.3.3 and Table 1.

APPENDIX B
Objective Basis for Establishing a De minimus Condition for Lead

The construction standard does not specify a de minimus level of lead in materials below which the requirements of the lead standard do not apply. It is noted in the preamble to the lead construction standard (58 FR 26590, *Interim Final Standard, Lead in Construction*, May 4, 1993), that the construction standard applies to all occupational exposure to lead in all construction work in which lead, in any amount, is present in an occupationally related context. Exposure of employees to the ambient environment that may contain small concentrations of lead unrelated to the job is ***not*** subject to the standard (i.e., soils containing normal ambient concentrations of lead). Where the source of lead is employment related, all exposure to lead is covered by the standard.

The preamble goes on to state that although the standard may apply to a particular activity that involves materials containing small lead concentrations, certain minimum levels of lead exposure trigger almost all of the obligations in the standard. For example, periodic exposure monitoring and medical surveillance are required only if employee exposure is in excess of the AL. This distinction is made to differentiate between hazardous and relatively non-hazardous work operations and to impose obligations commensurate to the degree of hazard present. It is, therefore, not the intent of the standard to require compliance with all provisions where exposure to lead is at levels insignificant to workers' health.

The preamble also explains the logic for not establishing a de minimus level of lead in materials. The rationale points out the difficulty in relying on material concentrations to predict airborne concentrations, because of the variability based on activity and material type. Therefore, OSHA opted to trigger obligations of the standard based on personal exposures (i.e., the action level and permissible exposure limit).

A de minimus level of lead, therefore, cannot be defined in this Lead Control Program that would be applicable to all materials and all activities. However, a defensible rationale can be developed for a de minimus condition that combines a lead-in-material concentration threshold with a co-located indicator parameter (total particulates).

For the purposes of this Lead Control Program, dust- or mist-generating activities are generally safe from occupational exposure to lead above the AL:

a. When the total lead content of materials involved is less than 1,000 µg/g (ppm) (0.1%), and

b. When total particulates in the breathing zone of workers are maintained below the TLV of 10 mg/m3 as an 8-hour TWA. Both of these criteria must be met. This de minimus condition does not apply to lead fume-generating activities (i.e. heat producing activities such as welding and burning).

The objective basis for this de minimus condition is as follows. For a material with a total lead concentration of 1,000 µg/g, total airborne particulate concentrations of 30 mg/m3 would have to

be generated in the breathing zone of a worker over an 8-hour work shift to result in a lead exposure at the AL. This total particulate concentration is three times greater than the TLV of 10 mg/m3 for total particulates. To apply this 1,000 µg/g (0.1%) criterion, line management must ensure that total particulate concentrations in the breathing zone of workers, regardless of respiratory protection, are controlled to below the total particulate TLV of 10 mg/m3, which offers a three fold margin of safety for lead exposure relative to the AL. This de minimus condition does not apply to fume generating activities, because heat can selectively liberate lead fume from the material into the air and the worker's breathing zone.

This de minimus condition is based on fundamental industrial hygiene principles and not based on regulation. As such, its application must be done with project S&H professional input and must be based on a hazard analysis of jobs and tasks. Other accepted risk assessment or industrial hygiene analyses may also be acceptable for defining de minimus conditions. Whenever applying the de minimus condition to construction activities, it must be done with appropriate input from the project S&H professional who should evaluate whether there is reason to believe exposures could be at or above the action level.